

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

CICE COURSE OUTLINE

COURSE TITLE: Rigging, Hoisting and Material Handling

CODE NO. : CCT101 **SEMESTER:** Fall
MODIFIED CODE: CCT0101

PROGRAM: Construction Carpentry Techniques

AUTHOR: Mike Butcher
MODIFIED BY: Annunziata (Nancy) Tassone, Learning Specialist CICE
Program

DATE: Sept/2016 **PREVIOUS OUTLINE DATED:** 2015

APPROVED: _____ "Angelique Lemay" _____ Sept/16

_____ _____

DEAN **DATE**

TOTAL CREDITS: Four

PREREQUISITE(S): None

HOURS/WEEK: Three

Copyright © 2016 The Sault College of Applied Arts & Technology
*Reproduction of this document by any means, in whole or in part, without prior
written permission of Sault College of Applied Arts & Technology is prohibited.*
*For additional information, please contact the Dean, School of Community
Services Interdisciplinary Studies, Curriculum & Faculty Enrichment*
(705) 759-2554, Ext. 2737

I. COURSE DESCRIPTION:

CICE students, with assistance from a learning specialist, will learn about the methods and procedures used in rigging and hoisting operations. They will learn how to safely assist in the use of rigging and hoisting equipment and applications, communicate with co-workers using radio international hand signals, hoisting, use jacks in blocking and how to use manual lifting devices.

CICE students will also learn about the methods and procedures used in the safe handling of stationary equipment including pumps, compressors, generators and lighting stations.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student with the assistance of a Learning Specialist, will demonstrate the ability to:

1. Describe and demonstrate the use of material handling tools, equipment and personal protective equipment according to the manufacturer and Occupational Health and Safety Standards.
2. Describe the methods and procedures required for material handling and equipment load and unload operations according to the manufacturer and Occupational Health and Safety Standards.
3. Describe the methods and procedures required for moving material around the job site according to the manufacturer and Occupational Health & Safety Standards.
4. Describe the basics of centre of gravity and load distribution as they apply to loading, moving & hoisting of all materials on the job site according to industry standards, regulations and Occupational Health & Safety Standards.

III. TOPICS:

1. Introduction to construction related PPE (Personal Protective Equipment) - proper use & application.
2. Examine The Ontario Occupational Health & Safety Act & Regulations for Construction Projects, and understand how they apply to workers on construction projects.
3.
 - Identify, describe & understand material handling equipment and its safe use according to manufacturer's specifications and the Occupational

- Health and Safety Act. This will include equipment such as slings, (synthetic and wire rope), cables, chains, shackles, load binders, lifting clamps and hoists.
- Describe the selection and use of rigging & hoisting equipment for the work application.
 - Describe load/unload procedure signals required for co-workers communication.
 - Illustrate the documentation related to a load/unload procedure (i.e. the lift plan).
 - Illustrate the preparation of a load for shipping to a new site.
4. Describe methods & procedures for moving material around the job site.
- a) Identify the rigging & hoisting equipment for movement of material, including slings, cables, chains, shackles load binders, lifting clamps & hoists.
 - b) Recommend rigging & hoisting equipment for movement of material.
 - c) Apply the use of knots.
 - d) Illustrate signaling methods to co-workers regarding movement of material.
4. Define & apply the principles of centre of gravity and load management and apply them when selecting the appropriate material handling equipment for moving materials on a job site.
5. Describe daily inspection practices for equipment used in the movement of materials.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. **Rigging Fundamentals Trainee Guide** – Prentice Hall (Available in the Sault College Book Store)
2. **Ontario Occupational Health & Safety Consolidated Version** (Available in the Sault College Book Store)
3. **Personal Protective Equipment (PPE)** will be required during classes to be conducted in a shop environment. PPE required to be:
 - a) CSA Certified Hard Hat
 - b) CSA Certified (Green Patch) work boots
 - c) CSA Certified Safety Glasses
 - d) Work gloves

V. EVALUATION PROCESS/GRADING SYSTEM:

Quizzes ,Assignments & Tests	45%
Practical Tests	40%
<u>Attendance</u>	<u>15%</u>
Total	100%

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

All late assignments (without documentation) will receive a maximum grade of C (60%).

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI. SPECIAL NOTES:Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VI. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.

VIII. COURSE TOPIC AND CONTENT

Topic and Content	Reading
1. Math review	Hand outs
1.1 Volume, Area and Perimeter	
2. Math Review	Handout
2.1 Conversions	
2.2 Pressure, Density	
2.3 Introduction to construction related PPE (Personal Protective Equipment), its proper use & application.	
3. Rigging Devices and Centre of Gravity	
3.1 List of different rigging devices	Handout
3.2 Centre of Gravity,	
4. Slings and the Angular Factor	
4.1 Pythagorean Theorem	Handout
4.2 Triangles (3,4,5)	
4.3 Rigging Triangles	
4.4 Assignment #2	
#1 Calculate volume and weight of the object to be lifted,	
#2 Percent of the load slings X and Y,	
#3 Vertical load acting on sling X and Y,	
#4 Appropriate diameter of wire rope sling.	
5. Rigging Calculations	Handout
5.1 Sling choices	

Topic and Content	Reading
5.2 Safety Factors 5.3 Dd Ratios	
6. Rigging and Hoisting	
6.1 Shackle sizing	Handout
6.2 Lifting beam	
6.3 Crane capacity	
6.4 Spreader beam	
6.5 Ratchet hoists	
7. Rigging Hardware	
7.1 Inspection of Rigging Hardware	
7.2 Inspection of Slings	
7.3 Plate Clamps	
7.4 Hazards in Crane Operating Areas	
7.5 Types of Ropes	
8. Weight Estimating	Handout
8.1 Estimating Charts (Weight of different structural steel shapes)	
8.2 Assignment #5- Estimate the weight of a concrete block encased in steel	
9. Rope Knots	Handout
9.1 Types of rope knots	
9.2 Ten basic rope knots	
9.3 Activity #2- Tying the five basic rope knots	
10. Hand Signals	Hoisting Operation Cards
10.1 Types of hand signals used in hoisting and rigging.	
10.2 Activity #3- Using proper hand signals to lift an object.	

Addendum:

Further modifications may be required as needed as the semester progresses based on individual student(s) ability. All modifications to evaluation components and/or assessments must be discussed and agreed upon by the instructor and the learning specialist in advanced of assigned competition date

CICE Modifications:

Preparation and Participation

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.

The Learning Specialist may:

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.